

Eviota masudai, a New Gobiid Fish (Teleostei: Perciformes) from Japan

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松浦啓一^{1)*}・瀬能 宏²⁾：日本から採集されたハゼ科の1新種
Eviota masudai (アカイソハゼ)

Abstract: A new gobiid fish, *Eviota masudai*, is described from 25 specimens collected from the Pacific coasts of Honshu, Shikoku, Kyushu, the Izu Islands, the Ogasawara Islands, and the Sea of Japan. *Eviota masudai* is distinguished from the other species of *Eviota* by the following combination of characters: a light pink body; edge of each scale pocket reddish brown or brown, forming network on body; a small round bluish black or dark brown blotch on each side of nape just above opercle; 2 short longitudinal reddish brown or brown lines on cheek, the upper running posteriorly from postero-ventral corner of eye to a point midway between eye and posterior end of opercle, the lower line running from corner of mouth to a vertical line through posterior edge of eye; 2 short longitudinal reddish brown or brown bars or oval blotches on pectoral-fin base, one dorsally and the other ventrally; dorsal-fin rays VI-I, 10 (9 in only one specimen); lateral scale rows 23–25; cephalic sensory pore system complete; genital papillae of males non-fimbriate.

Key words: *Eviota masudai*, new species, gobiid fish, Japan, taxonomy

Introduction

The fishes of the genus *Eviota* is distributed widely in the Indo-Pacific and contains at least 50 valid species (Lachner & Karnella, 1980; Karnella & Lachner, 1981; Jewett & Lachner, 1983; Sunobe, 1988; Greenfield & Randall, 1999; Allen, 2001; Gill & Jewett, 2004; Shibukawa & Suzuki, 2005). However, there remain many unnamed species in *Eviota*, probably more than 30 species waiting for formal descriptions. Japan is well known for having a diversity of gobioid fishes, including at least 18 unnamed species of *Eviota* (Suzuki & Shibukawa, 2004). One of the unnamed *Eviota* species from Japan has been known under the Japanese name “Aka-isohaze” (meaning red inshore goby), inhabiting coastal waters along the main islands of Japan (Akihito *et al.*, 2000; Suzuki & Shibukawa, 2004). We herein describe this species under the name of *Eviota masudai* in memory of Hajime Masuda, recently deceased.

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Materials and Methods

Type specimens are deposited at the Australian Museum, Sydney (AMS); the Biological Laboratory, Imperial Household, Tokyo (BLIH), the Natural History Museum and Institute, Chiba (CBM), the Coastal Branch of Natural History Museum and Institute, Chiba (CMNH), the Kanagawa Prefectural Museum of Natural History, Odawara (KPM), the National Science Museum, Tokyo (NSMT), and the Yokosuka City Museum, Yokosuka (YCM).

Lengths of specimens given below are standard length (SL), measured from the anteriormost part of the upper lip to the mid-base of the caudal fin. Body depth is the maximum depth at the origin of the anal fin. Body width is the greatest distance between the pectoral-fin bases. Head length is the distance between the anteriormost part of the upper lip and the posterior edge of the opercular membrane. Snout length was taken from the same part of the upper lip to the nearest edge of the fleshy orbit. Interorbital width is the least distance between the fleshy orbits. Jaw length was taken from the anteriormost part of the upper lip to its posteriormost edge. Predorsal length is from the anteriormost part of the upper lip to the origin of the first dorsal fin. Preanal length is from the anteriormost part of the upper lip to the origin of the anal fin. Longest dorsal-fin spine length is from the base of the longest spine to its tip. Pectoral-fin length is from the base to the tip of the longest ray. Fourth and fifth pelvic-fin rays were measured from their base to the tip.

Lateral scale row count was made from the upper end of the gill opening to the mid-base of the caudal fin. Transverse scales were counted from the origin of the anal fin upward and forward to the base of the spinous dorsal fin. The number of primary branches on the fourth pelvic-fin ray was counted as in Lachner & Karnella (1980). The number of segments between the branches of the fourth pelvic fin ray was counted, excluding the segment at the base of each branch, those before the first branch, and those on the terminal unbranched portion of the ray (Lachner & Karnella, 1980). The terminology for cephalic sensory-canal pores follows Akihito (1984). Numbers in parentheses following counts show number of individuals with that specific count. Values with an asterisk refer to the count obtained for the holotype. X-ray photographs were taken to count the number of vertebrae. Photographs stored in the Image Database of Fishes (FishPix: <http://fishpix.kahaku.go.jp/fishimage-e/index.html>) were used for information on live color of *E. masudai* and to record distributions of *E. masudai*.

Eviota masudai sp. nov. [Japanese name: Aka-isohaze]

(Figs. 1–3)

Eviota sp. 2: Akihito *et al.*, 2000, p.1178.

Eviota sp. B: Suzuki & Shibukawa., 2004, p.120.

Holotype. NSMT-P 72545, male, 24.7 mm SL, Japan, Honshu, Chiba Prefecture, southeast coast of Boso Peninsula, Ubara, 35°07.46'N, 140°16.96'E, 15 m depth, 20 Aug. 2003

Paratypes. 24 specimens, 16.4–32.4 mm SL. **Honshu**: CMNH-ZF 6987, female, 21.6 mm SL, collection at 8 m depth, other collection data same as for holotype; CMNH-ZF 6997, male, 30.7 mm SL, same as preceding; CMNH-ZF 6998, female, 27.2 mm SL, same as preceding; YCM-P 27824, female, 22.6 mm SL, Sagami Bay, Kanagawa Prefecture, west coast of Miura Peninsula, Tenjinjima, 35°12'N, 139°36.3'E, 16 July 1994; NSMT-P 69251, male, 21.5 mm SL, Sagami-nada Sea, 35°10.85'N, 139°35.15'E to 35°01.92'N, 139°3.19'E, 59–64 m depth; KPM-NI 7395, male, 28.1 mm SL, Sagami

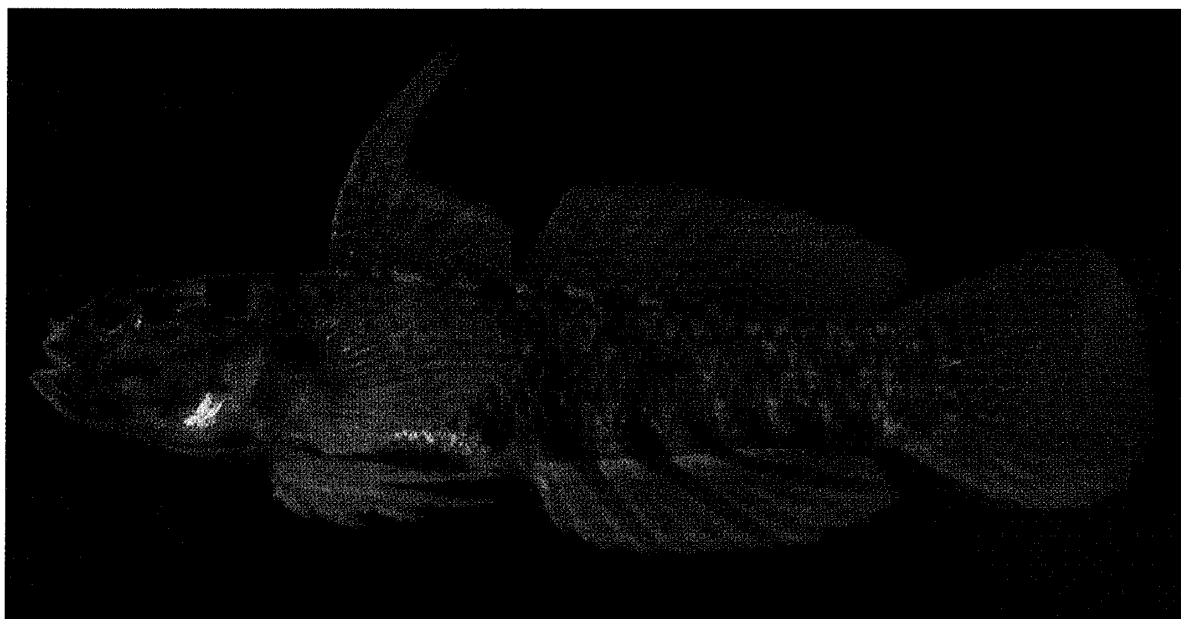


Fig. 1. *Eviota masudai*, holotype, NSMT-P 72545, 24.7 mm SL, Japan, Honshu, southeast coast of Boso Peninsula, photo by M. Aizawa.

Bay, southwestern corner of Miura Peninsula, Koajiro, 35°10'N, 139°37'E, 4 m depth, 9 November 2000; KPM-NI 7396, male, 24.8 mm SL, same as preceding; KPM-NI 7397, female, 23.6 mm SL, same as preceding; NSMT-P 34357, male, 18.6 mm SL, Sagami Bay, southeast coast of Kanagawa Prefecture, Miura Peninsula, Ebi-shima Island, 35°09'N, 139°37'E, 8 m depth, 25 April 1991; NSMT-P 34374, male, 23.0 mm SL, same as preceding; BLIH 19910759, male, 27.1 mm SL, Suruga Bay, northeast coast of Shizuoka Prefecture, Awa-shima Island, 35°02'N, 138°53'E, 19 July 1991. **Izu Islands:** KPM-NI 4182, 32.4 mm SL, tidepool at southern tip of Izu-oshima Island, 2–4 m depth, 34°43'N, 139°26'E, 22 November 1997; KPM-NI 4186, female, 22.6 mm SL, same as preceding; KPM-NI 4190, female, 24.8 mm SL, same as preceding; KPM-NI 4191, female, 25.7 mm SL, same as preceding. **Shikoku:** BLIH 19870321, female, 21.8 mm SL, southwest coast of Ehime Prefecture, west of Nishiumi Peninsula, Yokoshima Island, 32°56'N, 132°24'E, 11 September 1987; BLIH 19870797, female, 23.2 mm SL, same as preceding; BLIH 19920126, male, 29.7 mm SL, southwest coast of Kochi Prefecture, Kashiwa-jima Island, 32°46'N, 132°38'E, 13 August 1992; AMS I.43754-001, male, 20.4 mm SL, east coast of Tokushima Prefecture, Ishima Island, 33°51'N, 134°49'E, 6 m depth, 29 October 1999. **Kyushu:** CBM-ZF 11148, male, 25.6 mm SL, southeast coast of Kagoshima Prefecture, southwestern tip of Sata Cape, 30°59'N, 130°40'E, 30 June 1982; CBM-ZF 11149, female, 20.3 mm SL, same as preceding. **Ogasawara Islands:** BLIH 19910345, male, 21.2 mm SL, Ani-jima Island, 10–15 m depth, 26 July 1991; BLIH 19910760, male, 16.4 mm SL, same as preceding.

Non-type specimens. **Sea of Japan:** BLIH 19910750, 22.3 mm; BLIH 19910751, 25.8 mm, Oki Islands, west coast of Nakano-shima Island, 10 m depth, 36°04.5'N, 133°04.6'E, 28 July 1991. **Honshu:** CMNH-ZF 7295, 20.4 mm, Chiba Prefecture, southern tip of Boso Peninsula, Hasama, 31 January 1998; YCM-P 23946, 21.0 mm, the Sagami Sea, Shizuoka Prefecture, southwestern coast of Izu Peninsula, Tanoura Bay, 34°58.6'N, 134°47.3'E, 25 March 1990. **Inland Sea of Seto:** BLIH 19910010 (4 specimens), 15.2–23.5 mm SL, Ehime Prefecture, Hutakami-jima Island, 10 m depth, 11



Fig. 2. Underwater photographs of *Eviota masudai*. Top, male, Japan, Honshu, east coast of Izu Peninsula, 3 m depth, 19 July 2004, photo by K. Uchino; Middle, male, Japan, Izu Islands, Izu-oshima Island, photo by Y. Yoshino (KPM-NR 62117); Bottom, male with bright blue color in fins, giving warning to another male, Japan, Honshu, east coast of Izu Peninsula, 7 m depth, 23 July 1995, photo by K. Uchino.



Fig. 3. Underwater photograph of *Eviota masudai*, female, Japan, Honshu, west coast of Izu Peninsula, 4 m depth, 5 October 2003, photo by M. Uchino.

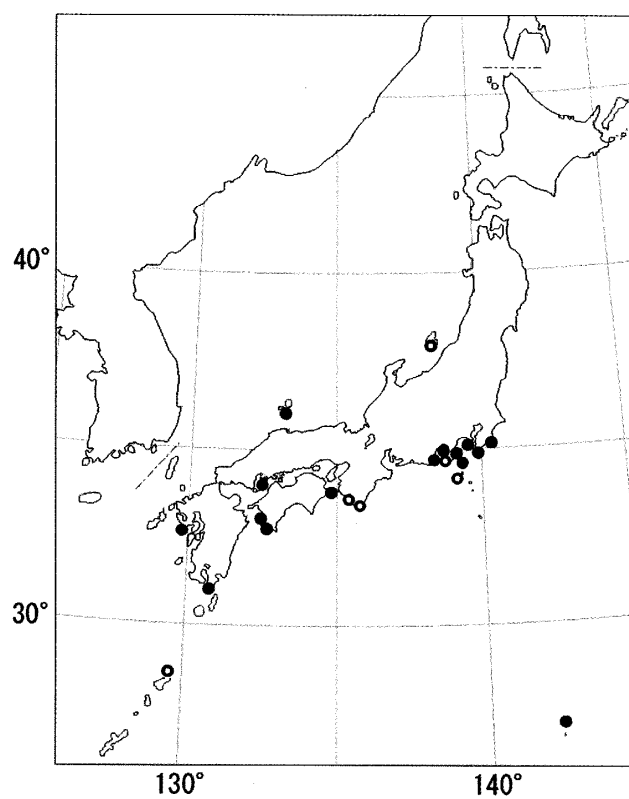


Fig. 4. Distributional records of *Eviota masudai*. Solid circle: specimens collected; open circle: underwater photographs taken.

January 1994. **Kyushu:** BLIH 20050144, 30.7 mm SL, BLIH 20050145, 34.0 mm SL, Nagasaki Prefecture, west coast of Nagasaki Peninsula, Koyagi, 32°41.5'N, 129°47.6'E, 6–8 m depth, 14 May 2005; CMNH-ZF 12605–12606, same as preceding, 12 m depth, 13 May 2005.

Photograph records (see FishPix). **Sea of Japan:** KPM-NR 0034615, Sado Island. **Honshu:** KPM-NR 0035105, Shizuoka Prefecture, west coast of Izu Peninsula, Toi, September 1998; KPM-NR 0037384, Shizuoka Prefecture, west coast of Izu Peninsula, Shishihama, 30 April 2000; KPM-NR 0036477, Wakayama Prefecture, southwestern coast of Kii Peninsula, Susami, 17 June 2000; KPM-NR 0042022, Wakayama Prefecture, southern tip of Kii Peninsula, Kushimoto, 6 October 1993. **Izu Islands:** KPM-NR 0033434, Kozu-shima Island, 13 August 1998,

Diagnosis. Distinguished from the other species of *Eviota* by having the following combination of characters: dorsal-fin rays VI-I, 10 (9 in only one paratype); typical males (11 of 14 males) have elongate and filamentous dorsal spines reaching to anterior 4th to 8th soft rays of second dorsal fin; anal-fin rays I, 9; pectoral-fin rays 17-18, including 12–17 branched rays; pelvic-fin rays I, 4, i (fifth ray absent in 2 paratypes), fifth pelvic-fin ray greatly reduced, averaging 14.1% (7.0–28.0%) of fourth ray length, pelvic-fin membranes well developed, extending beyond base of first branch of each pelvic-fin ray; lateral scale rows 23–25; transverse scale rows 6–8; cephalic sensory pore system complete *sensu* Lachner & Karnella (1980); genital papillae of males non-fimbriate; body light pink; edge of scale pockets reddish brown or brown, forming network on body; a small round bluish black or dark brown blotch on each side of nape just above opercle; 2 short longitudinal reddish brown or brown lines on cheek, the upper running posteriorly from postero-ventral corner of eye to a point midway between eye and posterior end of opercle, the lower line running from corner of mouth to a vertical line through posterior edge of eye; a short longitudinal reddish or dark brown line on anteroventral part of preopercle, just below the lower line on cheek; 2 short longitudinal reddish brown or brown bars or oval blotches on pectoral-fin base, one on the dorsal part and the other on the ventral part.

Description. Dorsal-fin rays VI-I, 10* (24), V-I, 9 (1); anal-fin rays I, 9*; pectoral-fin rays 17* (16), 18 (9), including 12 (1), 13 (5), 14 (7), 15* (5), 16 (4) or 17 (2) branched rays (not countable in the paratype CBM-ZF 11148 due to damage); pelvic-fin rays I, 4, i (fifth ray absent in 2 paratypes); branches on fourth pelvic-fin ray 4 (2), 5 (5), 6 (10), 7 (3), 8* (3), 9 (2); segments between consecutive branches of fourth pelvic-fin ray 2–13, usually 3–6* (rarely more than 6); vertebrae 10 + 16* (24), 10 + 17 (1); lateral scale rows 23* (14), 24 (10) or 25 (1); transverse scale rows 6 (4), 7 (19) or 8* (2); first and second dorsal spines elongate and filamentous in typical males (11 of 14 males) but not elongate or filamentous in 3 male paratypes and 11 female paratypes.

Proportional measurements are shown in Table 1. In typical males, first and second dorsal-fin spines greatly elongated into filaments, when adpressed reaching over anterior half of second dorsal fin; in non-typical males and females, first and second dorsal-fin spines not elongate, almost equal in length to anterior rays of second dorsal fin; second dorsal fin originating slightly before anal fin; pelvic fins reaching to between anus and first soft ray of anal fin; scales on body ctenoid, excepting those on belly cycloid; head, predorsal and prepelvic regions naked; teeth on jaws small and conical in bands with a slightly larger outer series.

Color in life. Body light pink; edges of scale pockets reddish brown or brown, making network on body; about 10 narrow transverse saddle-like white bands across dorsum from nape to caudal-fin base; 6 subcutaneous dark brown ventral midline spots, 3 on base of anal fin, 3 on caudal peduncle;

Table 1. Proportional measurements of *Eviota masudai*.

	Holotype	Paratypes	
		Males	Females
	NSMT-P 72545	13 specimens	11 specimens
Standard length (mm)	24.7	16.4 – 30.7	20.3 – 32.4
Measurements in % of SL			
Predorsal length	30.0	20.7 – 38.0	31.0 – 47.7
Precanal length	51.9	34.3 – 66.4	56.6 – 82.0
Body depth	18.2	11.3 – 21.5	15.1 – 26.8
Body width	12.7	8.5 – 15.1	12.1 – 18.3
Head length	27.2	17.2 – 33.6	25.9 – 44.9
Snout length	6.3	3.9 – 7.8	5.3 – 9.2
Eye diameter	6.5	5.2 – 8.2	7.3 – 10.1
Interorbital width	1.6	1.1 – 2.2	1.4 – 2.7
Jaw length	10.2	6.2 – 14.0	9.9 – 17.9
Longest dorsal-fin spine	31.3	12.1 – 49.8	12.8 – 22.8
Pectoral-fin length	24.9	17.0 – 31.7	25.0 – 33.8
Pelvic-fin length	24.5	17.1 – 29.8	20.8 – 33.2

top of head and interorbital space covered with irregular reddish brown or brown lines; nasal tubes white; eyes encircled with alternating reddish brown spots and yellowish lines, forming radiating pattern; 2 short longitudinal reddish brown or brown lines on cheek, the upper running posteriorly from postero-ventral corner of eye to a point midway between eye and posterior end of opercle, the lower line running from corner of mouth to a vertical line through posterior edge of eye; a short longitudinal reddish brown or brown line on anteroventral part of preopercle, just below the lower cheek line; 2 short longitudinal reddish brown or brown bars or oval blotches on pectoral-fin base, one on the dorsal part and the other on the ventral part; a small round bluish black or dark brown blotch on each side of nape just above opercle; a yellow blotch immediately before this occipital blotch; one or 2 small red blotches on each dorsal-fin membrane between spines and soft rays, making a horizontal reddish line on basal parts of first and second dorsal fins; dorsal-fin membranes light blue between these reddish blotches and dorsal-fin base; many small reddish orange spots scattered on dorsal-fin membranes dorsal to the reddish blotches; 3 longitudinal reddish streaks on anal fin, the first running on membrane between second and third soft rays, the second on the mid-part of anal fin, the third on immediately before posterior end of anal fin; other parts of anal-fin membranes yellowish with light blue basal parts, anal-fin rays light blue; pectoral and pelvic fins pale; caudal fin covered with many small reddish brown spots. Males in reproductive seasons having bright blue color in dorsal, anal, pelvic and caudal fins (Fig. 2, bottom).

Remarks. Lachner & Karnella (1980) proposed 6 groups in *Eviota* on the basis of the combination of several morphological characters such as cephalic sensory pore system, dorsal fins, pectoral fins, pelvic fins, and the number of vertebrae. *Eviota masudai* is classified into the "Group I" of Lachner & Karnella (1980) by having characters as follows: a complete cephalic sensory pore system, 26 (27 in only one paratype) vertebrae, the dorsal-anal fin formula 10/9, pectoral fins with some branched rays, and the genital papillae of males non-fimbriate. Among the species of "Group I", *E. masudai* is more similar to *E. abax* (Jordan & Snyder, 1901), *E. inutilis* Whitley, 1943, *E. melasma*

Lachner & Karnella, 1980 and *E. smaragdus* Jordan & Seale, 1906 in having a blackish occipital spot. *Eviota masudai* differs from these 4 species in having 9 anal-fin rays (vs. 8 anal-fin rays). In addition to the count of anal-fin rays, there are color differences between these species. *E. masudai* clearly differs from *E. abax* and *E. inutilis* in having 2 short longitudinal reddish brown or brown lines on the cheek (the cheek of *E. abax* and *E. inutilis* lacking the longitudinal lines). *Eviota smaragdus* is different from *E. masudai* in having semi-transparent whitish body with many brown blotches and bars. *Eviota melasma* is similar to *E. masudai* in having a pink to orange body and 2 longitudinal lines on the cheek. However, the 2 lines on the cheek in *E. melasma* are not solid but dots.

Eviota masudai was collected from the Pacific coasts of Honshu, Shikoku and Kyushu from the Boso Peninsula southward to the Osumi Peninsula, the Inland Sea of Seto, the Izu Islands, the Ogasawara Islands, and also from the Oki Islands in the Sea of Japan. The northernmost record of *E. masudai* was reported at Sado Island in the Sea of Japan by Y. Yoshino (FishPix: KPM-NR 0034615). *Eviota masudai* was photographed by H. Kanehara in Kasari Bay of Amami-oshima Island located in the north part of the Ryuyu Islands. *Eviota masudai* inhabits shallow rocky reefs at depths from 2 to 20 m, but one paratype (NSMT-P 69251, male, 21.5 mm SL) was collected from an oyster shell bed at depth of 59–64 m in the Sagami-nada Sea, off central Honshu, by dredging from the R/V *Rinkai-maru*.

Etymology. The new species is named for late Hajime Masuda who greatly contributed to Japanese and Indo-west Pacific ichthyology through his many books containing excellent photographs.

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要 約

イソハゼ属の1新種 *Eviota masudai* を25個体の標本に基づいて記載した。本種はイソハゼ属の他種から以下の特徴によって区別される：体が赤い、鱗の縁辺が赤色または赤褐色を呈し体表面に網目状の模様を形成する、後頭部に暗青色を呈する円形の斑紋が1個ある、頬に赤色または赤褐色の2本の縦線があり（背方の線は眼から後方へ延長し、眼と主鰓蓋骨後縁との中間に達し、腹方の線は口の後縁から眼の後部下方に達する）、胸鰭基底に2本の赤褐色の縦帯がある、第1背鰭は6棘から構成され、第2背鰭は1棘10軟条（1個体のみ9軟条）から構成される、側線鱗は23–25枚、頭部感覚系は完全、そして、雄の生殖突起が枝分かれない。本種は本州の房総半島、三浦半島、伊豆半島、駿河湾、伊豆大島、高知県柏島、徳島県牟岐大島、愛媛県宇和島、鹿児島県大隅半島、日本海の隠岐島、小笠原諸島の兄島から採集されている。また、水中写真によって、伊豆諸島神津島、相模湾葉山、駿河湾三保、紀伊半島（和歌山県周参見・串本・南部、三重県熊野）、佐渡島および奄美大島から記録されている。

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